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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,027	01/24/2007	Urs Burckhardt	127688	8790
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OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER LEONARD, MICHAEL L.	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 09/21/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction27049@oliff.com  
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### Office Action Summary

**Application No.**

10/576,027

**Applicant(s)**

BURCKHARDT ET AL.

**Examiner**

MICHAEL LEONARD

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/08)  
Paper No(s)/Mail Date 08/26/2010

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Double Patenting***

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-28 of copending Application No. 11/822111 U.S. Patent No. 4,853,454 to Merger et al. and U.S. Patent No. 5,116,931 to Reisch et al. The copending claims encompass the instantly claimed inventions broadly and it would have been obvious to a person of ordinary skill in the art from the teachings of Merger and Reisch in relation to the polyaldimine and the polyols that react with the polyisocyanates to form the composition of the pending claims. Resich discloses double metal cyanide catalyzed polyols with molecular weight of about 1,000 to 6,000 and a degree of unsaturation of no greater than 0.04 milliequivalents per gram of polyol that are utilized in the preparation of polyurethane prepolymers (Column 2, lines 1-69). At the time of the invention it would have been obvious to a person of ordinary skill in the art use DMC to catalyze the polyethers of the prepolymers disclosed above because this reduces es unsaturation, which gives less chain termination and therefore raises the molecular weights and the modulus and the attending properties related to modulus and molecular weight of the

subsequent polyols and polyurethanes produced therefrom as disclosed by Resich (Column 1, lines 18-52).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-30 of copending Application No. 12/000763 in view of U.S. Patent No. 4,853,454 to Merger et al. The copending claims encompass the instantly claimed inventions broadly. They fail to recite instantly claimed component B but the copending claims encompass using such compounds because Merger discloses such compounds and it would have been obvious to a person of ordinary skill in the art from the disclosure of Merger to ascertain the aldehyde compositions as disclosed by the copending application. Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldehydes are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1. Merger further discloses oxa-alkyl radicals used for R3 (Column 3, lines

65-69) and aldehydes of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5. Merger further discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/501074 in view of U.S. Patent U.S. Patent No. 4,853,454 to Merger et al. The copending claims encompass the instantly claimed inventions broadly. They fail to recite instantly claimed component B but the copending claims encompass using such compounds because Merger discloses such compounds and it would have been obvious to a person of ordinary skill in the art from the disclosure of Merger to ascertain the aldehyde compositions as disclosed by the copending application. Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldimines are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl

radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1. Merger further discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69) and aldehydes of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5. Merger further discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of copending Application No. 10/501078 in view of U.S. Patent No. 4,853,454 to Merger et al., and U.S. Patent No. 5,116,931 to Reisch et al. The copending claims encompass the instantly claimed inventions broadly and it would have been obvious to a person of ordinary skill in the art from the teachings of Merger and Reisch in relation to the polyaldimine and the polyols that react with the polyisocyanates to form the composition of the pending claims. Resich discloses double metal cyanide catalyzed polyols with molecular weight of about 1,000 to 6,000 and a degree of unsaturation of no greater than 0.04 milliequivalents per gram of polyol that are utilized in the preparation of polyurethane prepolymers (Column 2, lines 1-69). At the time of the invention it would have been obvious to a person of ordinary skill in the art use DMC to catalyze the polyethers of the prepolymers disclosed above because this reduces unsaturation, which gives less chain termination and therefore raises the molecular weights and the

modulus and the attending properties related to modulus and molecular weight of the subsequent polyols and polyurethanes produced therefrom as disclosed by Resich (Column 1, lines 18-52).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 of copending Application No. 10522412 in view of U.S. Patent No. 4,853,454 to Merger et al. The copending claims encompass the instantly claimed inventions broadly. The copending claims encompass the instantly claimed inventions broadly. They fail to recite instantly claimed component B but the copending claims encompass using such compounds because Merger discloses such compounds and it would have been obvious to a person of ordinary skill in the art from the disclosure of Merger to ascertain the aldehyde compositions as disclosed by the copending application. Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldehydes are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10

carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1. Merger further discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69) and aldehydes of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5. Merger further discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 11/470588 U.S. Patent No. 4,853,454 to Merger et al. The copending claims encompass the instantly claimed inventions broadly. They fail to recite instantly claimed component B but the copending claims encompass using such compounds because Merger discloses such compounds and it would have been obvious to a person of ordinary skill in the art from the disclosure of Merger to ascertain the aldehyde compositions as disclosed by the copending application. Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldehydes are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and



R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1. Merger further discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69) and aldehydes of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5. Merger further discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

Claims 1-24 and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 12/056043 in view of U.S. Patent No. 4,853,454 to Merger et al. The copending claims encompass the instantly claimed inventions broadly. They fail to recite instantly claimed component B but the copending claims encompass using such compounds because Merger discloses such compounds and it would have been obvious to a person of ordinary skill in the art from the disclosure of Merger to ascertain the aldehyde compositions as disclosed by the copending application. Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldehydes are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7

(line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1. Merger further discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69) and aldehydes of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5. Merger further discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

This is a provisional obviousness-type double patenting rejection.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-24 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The claims disclose a two-pack polyurethane composition. The disclosure fails to disclose what a pack is and furthermore fails to

even mention the polyurethane composition is a two-pack composition. The instant disclosure is concerned with two-component compositions, which is different than two-pack compositions, especially when considering the lack of description for the term pack.

***Claim Rejections - 35 USC § 103***

Claims 1-5, 9, 11-16, 19-20, 23-24 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,853,454 to Merger et al. in view of U.S. Patent No. 4,895,883 to Pedain et al.

As to claims 1 and 13, Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldimines are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1.

Merger discloses that the single component polyurethane prepolymer containing polyaldimine is reacted with water and placed into a mold (Column 4, lines 43-45).

Merger does not disclose wherein the polyaldimine and water are separate from the polyurethane prepolymer before adding the two together.

However, Pedain discloses polyurethane/urea prepared from polyurethane prepolymers and mixtures of amines including polyaldimines and water (Column 7, lines 38-40). Therefore, Pedain meets the limitation that one pack of the polyurethane be the polyurethane prepolymer and the second pack is the mixture of curing agents, which includes water and polyaldimines (See Examples). Pedain uses a two-component PUR gun spraying machine (Example 1). Pedain references Konig (U.S. Patent No. 4,108,842) for reasons to use a mixture of polyaldimines with water. Konig discloses that when using separate mixtures of polyaldimines and water in reaction with polyisocyanate prepolymers the rate of hardening of the films and laquers/coatings may virtually be controlled as desired depending upon the quantity of water used and may be adapted to the given conditions. Therefore, at the time of the invention it would have been obvious to a person of ordinary skill in the art to separate the curatives (water and polyaldimines) into a preformed mixture before adding the curative to the polyisocyanate prepolymer in order to obtain better control on the rate of hardening of the coating/laquers or films as evidenced by Konig (Column 2, lines 41-57).

As to claim 2, Merger discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69).

As to claims 3-5, Merger discloses an aldehyde of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5.

As to claim 9, Merger discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

As to claim 11, Merger discloses as suitable preferred polyamines 1,6-hexamethylenediamine, IPDA, and di- and/or tri-functional polyoxyalkylene polyamines having molecular weights of from about 110 to 5000 and preferably from 200 to 500 (Column 8, lines 50-66).

As to claim 12, Merger discloses an  $\text{NH}_2/\text{CHO}$  ratio of from 1:1 to 5 (Column 7, lines 31-32).

As to claim 14, Pedain discloses that the quantity of water required may be varied within the claimed limits in such a way that the reactivity of the hardener mixture may be fully adapted to the reactivity of the NCO prepolymer and the hardening conditions (Column 7, lines 51-55). Pedain further discloses molar ratios of water to prepolymer to amine hardener (Column 6, lines 1-3). Therefore, a person of ordinary skill in the art could work through the ratios via routine experimentation based on the reactivity of the prepolymer and hardening conditions desired to arrive at the presently claimed invention as evidenced by Pedain.

As to claim 15, Merger discloses polyether polyols are preferably used having a functionality of about 2 (Column 6, lines 25-26).

As to claim 16, Merger discloses a polyoxypropylene glycol and a polyoxypropylene-polyoxyethylene glycol that are used to from the polyurethane prepolymer (Column 10, lines 49-53).

As to claim 19, Merger discloses that the polyurethane prepolymer and the polyaldimine are mixed together in such quantities such that from about 0.2 to 1.3 equivalents, and more preferably of from 0.5 to 0.9 equivalents of polyaldimine are present per NCO group of the prepolymers (Column 10, lines 5-15).

As to claims 20, Pedain discloses that the reaction of the NCO prepolymers with the ketimine-containing hardener mixtures is carried out in the presence of organic solvents and the polyurethane urea coating thus formed is cured on the substrate of choice (Claim 9).

As to claims 23-24 and 26, Merger discloses preparing a polyurethane adhesive by reacting a polyurethane prepolymer (Example 3, Column 11), with a polyaldimine from Table 1 and curing in the presence of moisture (Column 4, lines 43-45).

Claims 6-8 and 10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,853,454 to Merger et al. in view of U.S. Patent No. 4,895,883 to Pedain et al. that has been explained above and is applied here as such in view of U.S. Patent No. 3,935,274 to Jacobsen et al.

Merger fails to disclose the instantly claimed aldehyde of instant claims 6-8, and the method of making the aldehyde.

As to the claims, it would have been obvious to a person of ordinary in the art at the time of the invention to make the instantly claimed aldehydes and ultimately the polyaldimines of the instant claims because this is a known means for adding carboxylate to hydroxy functional aldehydes made from isobutylaldehyde and

formaldehyde as taught by Jacobson (Abstract, Column 1, lines 5-43) and it is within the ability of the ordinary skilled artisan to make the above discussed aldehydes by appropriately changing the acid to one needed in the above discussed aldehydes.

Claims 17-18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,853,454 to Merger et al. in view of U.S. Patent No. 4,895,883 to Pedain et al. that has been explained above and is applied here as such in view of U.S. Patent No. 5,116,931 to Reisch et al.

As to the claims, Merger is silent on the degree of unsaturation of the polyols.

Resich discloses double metal cyanide catalyzed polyols with molecular weight of about 1,000 to 6,000 and a degree of unsaturation of no greater than 0.04 milliequivalents per gram of polyol that are utilized in the preparation of polyurethane prepolymers (Column 2, lines 1-69).

At the time of the invention it would have been obvious to a person of ordinary skill in the art use DMC to catalyze the polyethers of the prepolymers disclosed above because this reduces es unsaturation, which gives less chain termination and therefore raises the molecular weights and the modulus and the attending properties related to modulus and molecular weight of the subsequent polyols and polyurethanes produced therefrom as disclosed by Resich (Column 1, lines 18-52).

Claims 21-22 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,853,454 to Merger et al. in view of U.S. Patent No. 4,895,883 to

Pedain et al. that has been explained above and is applied here as such in view of U.S. Patent No. 5,194,488 to Piestert et al.

As to claims 21-22, Merger fails to disclose the method of mixing.

However, it would have been obvious to a person of ordinary skill in the art at the time of invention to apply the polyurethane system of Merger with the apparatus of the instant claims 21-22 because Piestert discloses using similar devices (Column 4, lines 30-69) to apply the adhesive and the applicant shows the instantly claimed device to be a commercially available apparatus for applying a two-part adhesive or coating in their examples and the use of commercially available devices would give the known benefits of the known devices without the need to make said device from scratch.

Claims 1-5, 9, 11-16, 19-20, 23-24 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,895,883 to Pedain et al. in view of U.S. Patent No. 4,853,454 to Merger et al.

As to claim 1, Pedain discloses a two-component PUR (Example 1) prepared from NCO prepolymer containing isocyanate-end groups and a hardener mixture that contains at least an aldimine and water (Abstract). Pedain teaches wherein the bis-aldimine is prepared from primary containing diamines (Column 7, lines 42-65) and ketones or aldehydes, such as acetaldehyde, acetone, methyl ethyl ketone, butyraldehyde, etc. (Column 8, lines 11-18).

Pedain fails to disclose the preferred aldehydes.



However, Merger discloses a polyurethane composition mixed with water (Column 4, lines 44-45) prepared from a polyurethane prepolymer made from polyisocyanates and polyols (Column 4, lines 55-57) and at least one polyaldimine of the formulas in Column 3 (lines 5-10). The polyaldimines are made from primary aliphatic, cycloaliphatic or polyoxyalkylene polyamines (Column 8, lines 1-42) and aldehydes of the formulas disclosed in column 7 (line 25) wherein R1 and R2, which may be the same or different, are branched or preferably linear alkyl groups having from 1 to 6 carbon atoms, preferably methyl and R3 is a -OR6-, CO-OR6, or -O-CO-R7, wherein R6 is a branched or linear alkyl group having from 1 to 10 carbon atom or preferably a linear oxa-alkyl radical having 1 to 10 carbon atoms (Column 4, lines 1-7). These formulas meet the claimed formulas of instant claim 1.

At the time of the invention it would have been obvious to a person of ordinary in the art at the time of the invention to make the instantly claimed aldehydes and ultimately the polyaldimines of the instant claims because this is a known means for adding carboxylate to hydroxy functional aldehydes made from isobutylaldehyde and formaldehyde as taught by Merger (Column 4, lines 1-7) and it is within the ability of the ordinary skilled artisan to make the above discussed aldehydes by appropriately changing the acid to one needed in the above discussed aldehydes.

As to claim 2, Merger discloses oxa-alkyl radicals used for R3 (Column 3, lines 65-69).

As to claims 3-5, Merger discloses an aldehyde of the second formula under column 3 (line 8) wherein R4 is the same as R3 (-OR6-, CO-OR6, or -O-CO-R7), which meets the claimed language of instant claims 3-5.

As to claim 9, Merger discloses that R1 and R2 of the formulas under column 3 are preferably methyl groups (Column 3, line 62).

As to claim 11, Merger discloses as suitable preferred polyamines 1,6-hexamethylenediamine, IPDA, and di- and/or tri-functional polyoxyalkylene polyamines having molecular weights of from about 110 to 5000 and preferably from 200 to 500 (Column 8, lines 50-66).

As to claim 12, Merger discloses an NH<sub>2</sub>/CHO ratio of from 1:1 to 5 (Column 7, lines 31-32).

As to claim 14, Pedain discloses that the quantity of water required may be varied within the claimed limits in such a way that the reactivity of the hardener mixture may be fully adapted to the reactivity of the NCO prepolymer and the hardening conditions (Column 7, lines 51-55). Pedain further discloses molar ratios of water to prepolymer to amine hardener (Column 6, lines 1-3). Therefore, a person of ordinary skill in the art could work through the ratios via routine experimentation based on the reactivity of the prepolymer and hardening conditions desired to arrive at the presently claimed invention as evidenced by Pedain.

As to claim 15, Merger discloses polyether polyols are preferably used having a functionality of about 2 (Column 6, lines 25-26).

As to claim 16, Merger discloses a polyoxypropylene glycol and a polyoxypropylene-polyoxyethylene glycol that are used to form the polyurethane prepolymer (Column 10, lines 49-53).

As to claim 19, Merger discloses that the polyurethane prepolymer and the polyaldimine are mixed together in such quantities such that from about 0.2 to 1.3 equivalents, and more preferably of from 0.5 to 0.9 equivalents of polyaldimine are present per NCO group of the prepolymers (Column 10, lines 5-15).

As to claims 20, Pedain discloses that the reaction of the NCO prepolymers with the ketimine-containing hardener mixtures is carried out in the presence of organic solvents and the polyurethane urea coating thus formed is cured on the substrate of choice (Claim 9).

As to claims 23-24 and 26, Merger discloses preparing a polyurethane adhesive by reacting a polyurethane prepolymer (Example 3, Column 11), with a polyaldimine from Table 1 and curing in the presence of moisture (Column 4, lines 43-45).

Claims 6-8 and 10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,895,883 to Pedain et al. in view of U.S. Patent No. 4,853,454 to Merger et al. that has been explained above and is applied here as such in view of U.S. Patent No. 3,935,274 to Jacobsen et al.

Pedain fails to disclose the instantly claimed aldehyde of instant claims 6-8, and the method of making the aldehyde.

As to the claims, it would have been obvious to a person of ordinary in the art at the time of the invention to make the instantly claimed aldehydes and ultimately the polyaldehydes of the instant claims because this is a known means for adding carboxylate to hydroxy functional aldehydes made from isobutylaldehyde and formaldehyde as taught by Jacobson (Abstract, Column 1, lines 5-43) and it is within the ability of the ordinary skilled artisan to make the above discussed aldehydes by appropriately changing the acid to one needed in the above discussed aldehydes.

Claims 17-18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,895,883 to Pedain et al. in view of U.S. Patent No. 4,853,454 to Merger et al., that has been explained above and is applied here as such in view of U.S. Patent No. 5,116,931 to Reisch et al.

As to the claims, Pedain is silent on the degree of unsaturation of the polyols.

Resich discloses double metal cyanide catalyzed polyols with molecular weight of about 1,000 to 6,000 and a degree of unsaturation of no greater than 0.04 milliequivalents per gram of polyol that are utilized in the preparation of polyurethane prepolymers (Column 2, lines 1-69).

At the time of the invention it would have been obvious to a person of ordinary skill in the art use DMC to catalyze the polyethers of the prepolymers disclosed above because this reduces unsaturation, which gives less chain termination and therefore raises the molecular weights and the modulus and the attending properties related to

modulus and molecular weight of the subsequent polyols and polyurethanes produced therefrom as disclosed by Resich (Column 1, lines 18-52).

Claims 21-22 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,895,883 to Pedain et al. in view of U.S. Patent No. 4,853,454 to Merger et al. that has been explained above and is applied here as such in view of U.S. Patent No. 5,194,488 to Piester et al.

As to claims 21-22, Pedain fails to disclose the method of mixing.

However, it would have been obvious to a person of ordinary skill in the art at the time of invention to apply the polyurethane system of Pedain with the apparatus of the instant claims 21-22 because Piester discloses using similar devices (Column 4, lines 30-69) to apply the adhesive and the applicant shows the instantly claimed device to be a commercially available apparatus for applying a two-part adhesive or coating in their examples and the use of commercially available devices would give the known benefits of the known devices without the need to make said device from scratch.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LEONARD whose telephone number is (571)270-7450. The examiner can normally be reached on Mon-Fri 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/  
Supervisory Patent Examiner, Art Unit 1796

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